WHAT IS CLAIMED IS:

1. A method for generating a low-density parity check code consisting of an information-part matrix and a parity-part matrix, comprising the steps of:

changing the information-part matrix to an array code structure, and allocating a degree sequence to each of submatrix columns;

extending the parity-part matrix such that an offset value between diagonal lines has a predetermined value in a generalized dual-diagonal matrix which is the parity-part matrix;

lifting the generalized dual-diagonal matrix;

determining an offset value for cyclic column shift for each submatrix of the lifted generalized dual-diagonal matrix; and

performing an encoding process for determining a parity symbol corresponding to a column of the parity-part matrix.

2. The method of claim 1, wherein the degree sequence is formed in accordance with Equation (37).

$$D = \{15, 15, 15, 5, 5, 5, 4, 3, 3, 3, 3, 3, 3, 3, 3\} \quad \ldots\ldots\ldots (37)$$

3. The method of claim 1, wherein the offset value between diagonal lines is relatively prime to the number of columns in the generalized dual-diagonal matrix.

4. The method of claim 1, wherein the number of rows in the submatrix is a prime number.

5. The method of claim 1, wherein a difference between a sum of offset values for cyclic row shift of a submatrix on a diagonal line in a generalized dual-diagonal matrix which is the parity-part matrix and a sum of

offset values for cyclic row shift of a submatrix on an offset diagonal line is not 0.

6. The method of claim 1, wherein the encoding process comprises the process of:

(a) determining a parity symbol of a first row in a submatrix with a submatrix column index 0 on a diagonal line of the parity-part matrix;

(b) setting a row index in a submatrix of a parity symbol being identical to the determined parity symbol in column index in a submatrix in a submatrix on an offset diagonal line having the same submatrix column index as the submatrix column index of the set parity symbol;

(c) determining a parity symbol having the same row index in the set submatrix in a submatrix on a diagonal line having the same submatrix row index as the submatrix row index of the submatrix on the offset diagonal line; and

(d) repeatedly performing the steps (b) and (c) until generation of the parity matrix is completed.

7. The method of claim 6, wherein in step (a), the parity symbol is determined by a sum of information symbols of the information-part matrix existing in the same row as a row index in the submatrix whose parity symbols are determined.

8. The method of claim 6, wherein in step (b), the row index in the submatrix is set in accordance with Equation (38).

$$y^{(2)}_{i+(r-f)} = x^{(1)}_{i} - j_{2(i+(r-f))+1} \quad \ldots\ldots\ldots\ldots (38)$$

where $v^{(2)}_{i+(r-f)}$ denotes a row index in a submatrix with a submatrix column index i on an offset diagonal line, $x^{(1)}_{i}$ denotes a column index in a submatrix with a column index i existing in a diagonal line, and $j_{2(i+(r-f))+1}$ denotes an offset value for cyclic column shift of a submatrix with a submatrix column index i on

the offset diagonal line.

9. The method of claim 6, wherein in step (c), the parity symbol is determined in accordance with Equation (39).

$$P_{x^{(1)}_{i+(r-f)}} = P_{x^{(1)}_i} + v_{y^{(2)}_{i+(r-f)}} \quad \ldots\ldots\ldots\ldots (39)$$

where $p_{x^{(1)}_{i+(r-f)}}$ denotes a parity symbol corresponding to $x^{(1)}_{i+(r-f)}$, $p_{x^{(1)}_i}$ denotes a parity symbol corresponding to a column index $x^{(1)}_i$, and $v_{y^{(2)}_{i+(r-f)}}$ denotes a sum of information symbols existing in a row with a row index $y^{(2)}_{i+(r-f)}$ in a submatrix with a submatrix column index i+(r-f).